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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,216	02/13/2001	Daniel Woodruff	SEMT119051	9703

25096 7590 08/06/2003

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EXAMINER

MUTSCHLER, BRIAN L

ART UNIT	PAPER NUMBER
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1753

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DATE MAILED: 08/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/782,216

Applicant(s)

WOODRUFF ET AL.

Examiner

Brian L. Mutschler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 May 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 & 14.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-12, in Paper No. 13 is acknowledged.
2. It is noted that Applicant's response and amendment included an incomplete listing of the claims; claim 25 was missing. Please be sure to include all claims in future amendments.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **1** (the reactor as described on page 9), **752** (bottom cover as described on page 13), **103** and **107** (manifold channels as first described on page 19), and **920** (conductive ring as described on page 26). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: **95** (shown in figures 4B, 4C and 4D), **165** (shown in figure 5), and **2365** (shown in figures 7A and 7B). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply

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to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to because the reference sign **203** in figure 7A should be changed to **200**. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

6. The disclosure is objected to because of the following informalities:
- a. On page 8 at line 9, the phrase "FIGURE 2 million" appears to be incorrect.
 - b. On page 9 at line 12, please change "3" to --703--.
 - c. On page 24 at line 15, please change "axle 22" to --axle 220--.
 - d. On page 26 at line 14, please fill in the appropriate information in the blanks.

Appropriate correction is required.

Claim Objections

7. Claim 10 is objected to because of the following informalities:
- a. Please insert a period --. at the end of the line.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. Claims 2-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "a programmable controller connected to control the movable electrode assembly into the cleaning electrode during a cleaning cycle" in lines 1-3. This limitation is indefinite because it is unclear how the controller *controls* the electrode assembly *into the cleaning electrode*. It appears that the claim should use similar language as that presented in the disclosure on page 6 beginning at line 8, wherein "a programmable controller is connected to direct the movable electrode assembly to move to the cleaning electrode during a cleaning cycle." The same applies to dependent claims 3-6.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Shinogi et al. (U.S. Pat. No. 5,344,539).

Shinogi et al. disclose an apparatus for electrochemically processing a workpiece comprising a moveable counter electrode 1 having a motion path over the workpiece 14

(col. 3, lines 41-60; fig. 5). The counter electrode has two different types of electrodes, an addition electrode **1** and removing electrodes **3** (col. 3, lines 46-49). The removing electrodes are used for electrochemical etching, i.e., cleaning. Platinum is used for the electrodes **2** and **3** (col. 3, lines 57-60). The processing apparatus can be used for processing circuit patterns on semiconductor substrates (col. 1, lines 13-27).

Since Shinogi et al. teach all of the structural limitations recited in the instant claim, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1-6, 8 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson et al. (U.S. Pat. No. 6,174,425) in view of Kaufman et al. (U.S. Pat. No. 6,197,182).

Simpson et al. disclose an apparatus for processing a semiconductor workpiece comprising an electrode assembly **34** and an additional electrode **37**, referred to as a modifier by Simpson et al. (col. 5, lines 12-27). The modifier **37** is biased with a potential to perform a cleaning operation (col. 5, lines 19-21). The apparatus uses electroactive solutions, i.e., electrolytes (col. 5, lines 49-55).

The apparatus of Simpson et al. differs from the instant invention because Simpson et al. do not teach the following:

- a. The electrode assembly is movable, as recited in claim 1.
- b. A programmable controller and its associated uses, as recited in claims 2-6.
- d. The moveable electrode assembly comprises one or more sets of fluid delivery ports, as recited in claims 8 and 12.
- e. The movable electrode assembly comprises one or more sets of fluid recovery ports, as recited in claims 11 and 12.

Regarding claims 1, 8, 11 and 12, Kaufman et al. teach a electrochemical processing apparatus comprising an electrode assembly **306** similar in geometry and function to the electrode assembly of Simpson et al., wherein the electrode assembly **306** is rotatable to randomly stir the electrolyte solution (col. 19, lines 58-64). The electrode **650** is preferably a metallic mesh (col. 21, lines 36-39).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the electrode of Simpson et al. to use a rotatable, mesh electrode as taught by Kaufman et al. because the rotatable, mesh electrode allows the stirring of the electrolyte solution and the passage of the electrolyte through the electrode, which results in a more uniform electrolyte distribution.

Regarding claims 2-6, Kaufman et al. disclose that the apparatus is controlled by a processor or computer (col. 6, lines 49-50).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Simpson et al. to use a programmable controller such as the computer taught by Kaufman et al. to control the apparatus because such an automated control would increase the precision of the electrochemical processing apparatus. Although the computer of Kaufman et al. is not disclosed to perform the intended functions recited in the claims, a computer would be capable of performing such functions and the references teach all of the structural limitations recited in the claims.

13. Claims 2-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinogi et al. (U.S. Pat. No. 5,344,539) in view of Adams et al. (U.S. Pat. No. 6,132,586).

Shinogi et al. disclose an apparatus having all of the limitations recited in claim 1 of the instant invention, as explained above in section 10.

The apparatus of Shinogi et al. differs from the instant invention because Shinogi et al. do not teach the use of a programmable controller and its associated uses, as recited in claims 2-6.

Adams et al. teach an apparatus for electrochemically processing semiconductor wafers comprising adding electrode areas and removing electrode areas in a movable electrode assembly (col. 7, line 42 to col. 8, line 4). The apparatus is controlled using a control computer **610** (col. 10, lines 48-52).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Shinogi et al. to use a control computer as taught by Adams et al. because a control computer allows the automation of the process and offers more precise control of the apparatus. Although the computer of Adams et al. is not disclosed to perform the intended functions recited in the claims, a computer would be capable of performing such functions and the references teach all of the structural limitations recited in the claims.

14. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shinogi et al. (U.S. Pat. No. 5,344,539) in view of Adams et al. (U.S. Pat. No. 6,132,586), as applied above to claims 2-6, and further in view of Haydu et al. (U.S. Pat. No. 6,024,856).

Shinogi et al. and Adams et al. describe an apparatus having the limitations recited in claims 1-6 of the instant invention, as explained above in sections 10 and 13. As explained above, Shinogi et al. teaches that platinum is used for the electrodes **2** and **3** (col. 3, lines 57-60).

Haydu et al. disclose an apparatus for electrochemically processing silicon wafers using suitable insoluble electrodes such as platinum and platinized titanium (col. 4, lines 50-53).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the electrode that uses platinum in the apparatus described by Shinogi et al. and Adams et al. to use a platinized titanium electrode

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because Haydu et al. teaches that platinum electrodes and platinized titanium electrodes are functionally equivalent for use in electrochemical processing apparatuses.

15. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson et al. (U.S. Pat. No. 6,174,425) in view of Kaufman et al. (U.S. Pat. No. 6,197,182), as applied above to claims 1-6, 8 and 10-12, and further in view of Datta et al. (U.S. Pat. No. 6,103,096).

Simpson et al. and Kaufman et al. describe an apparatus having the limitations recited in claims 1-6, 8 and 10-12 of the instant invention, as explained above in section 12.

The apparatus described by Simpson et al. and Kaufman et al. differs from the instant invention because they do not disclose the use of a rinse solution.

Datta et al. disclose an apparatus for the electrochemical processing of a wafer, wherein the apparatus uses an electrolytic solution and a rinsing solution so that each mode of operation may be used in the same apparatus (col. 5, lines 23-30).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus described by Simpson et al. and Kaufman et al. to use a rinsing solution in addition to the electrolyte solution as taught by Datta et al. because the use of multiple solutions adds the functionality of rinsing to the apparatus.


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Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (703) 305-0180. The examiner can normally be reached on Monday-Friday from 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

blm
July 31, 2003